THE IMPACT OF SELF-REPORTED ADOLESCENT STRENGTHS ON THERAPEUTIC ALLIANCE AND PSYCHOTHERAPY OUTCOMES

A Dissertation

by

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ABSTRACT

Despite the advances in strengths-based and clinical outcomes research, there have been no studies that attempt to better understand the intersection of these two bodies of literature. The current study hypothesized that self-reported adolescent strengths such as interpersonal relationships, relationships with parents, self-esteem, and self-reliance would significantly impact therapeutic alliance over the course of treatment and would moderate the association between the trend in alliance and the rate of change in therapy outcomes. Data was collected from 58 adolescents, ages 12-17. There was a total of 871 observations for the duration of treatment, ranging between 3 and 68 sessions. Hierarchical linear modeling (HLM) analyses were employed to better understand the longitudinal trends in the data. The results indicated that strengths, when controlling for age at onset and symptom type (e.g. internalizing vs externalizing symptomatology), did not significantly impact therapeutic alliance. Further, those same strengths did not moderate the overarching relationship between the trend in alliance and the rate of change in therapy outcomes. The study did indicate that therapeutic alliance increased over time, supporting the utility of patient-centered research on therapeutic processes. Recommendations for future research on strengths, therapeutic alliance, and outcomes research on clinical child therapy are discussed.

DEDICATION

For those who have supported me in rediscovering my own strengths:

> Her Time
>
> She has been feeling it for awhile—that sense of awakening. There is a gentle rage simmering inside her, and it is getting stronger by the day. She will hold it close to her—she will nurture it and let it grow. She won't let anyone take it away from her. It is her rocket fuel and finally, she is going places. She can feel it down to her very core—this is her time. She will not only climb mountains—she will move them too.
>
> -Lang Leav, *The Universe of Us*

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CHAPTER I

INTRODUCTION

Exploration and analysis of potential predictors of positive therapy outcomes has been a major focus within clinical research for the development and promotion of evidence-based practices (Lambert, 2001; Lambert, Hansen, & Finch, 2001; Lutz, 2003). One of the most prominent concepts studied in relation to clinical outcomes is the notion of therapeutic alliance (Safran & Muran, 2000). Originally defined and studied by the likes of Sigmund Freud, Edward Bordin, and other notable psychologists, therapeutic alliance, as it is now understood, comprises three features of the client/therapist relationship: 1) agreement between client and therapist on the goals of therapy, 2) collaboration between client therapist, and 3) personal bond between client and therapist (Bordin, 1979; Freud, 1912; Safran & Muran, 2000).

There is some evidence supporting the correlation between therapeutic alliance and clinical outcomes with scholars generally agreeing that higher levels of alliance predict more positive outcomes in therapy (Bickman et al., 2004; Martin, Garske, & Davis, 2000; Shirk & Karver, 2003). This association is often based on pre-post-test design (Howard, Moras, Brill, Martinovich, & Lutz, 1996; Lambert, Hansen, & Finch, 2001). The sole use of pre-post treatment data analyses, though, presents a limitation in this body of literature. Measurement and analysis of alliance either at one specific time point in treatment or averaging an overall score does not necessarily capture the true nature of its causal relationship to clinical outcomes over the entire duration of treatment (Barber, Connolly, Crits-Christoph, Gladis, & Siqueland, 2000). Some research suggests that ruptures and repairs in the therapeutic alliance may differentially impact treatment outcomes at one specific time point versus overall outcomes at intervention termination (Safran, Crocker, Shelly, & Murray, 1990). Analyzing alliance longitudinally may be

a more appropriate analytical method to study this potential causal role of therapeutic alliance on clinical outcomes.

In addition to these problems in the literature, little is known about specific variables that enhance or diminish therapeutic alliance in treatment. Findings across several meta-analytic reviews have suggested that client characteristics, like age and presenting symptomology, might impact the causal relationship between therapeutic alliance and treatment outcomes (Horvath, Del Re, Flückiger & Symonds, 2011; Martin, Garske & Davis, 2000). This is understandable as the current literature emphasizes the importance of examining the role client characteristics play in therapy; however, scholarly research has widely ignored the impact of positive characteristics, like individual strengths, on these therapeutic processes (Karver, Handelsman, Fields, & Bickman, 2006).

Strength-based approaches in assessment and therapy are critical for gaining a holistic picture of the client. Practitioners can employ these methods to identify and utilize internal and external resources clients already possess to continually promote mental wellness (Climie & Mastoras, 2015). Despite continued empirical support for the use and application of strengths across settings, strength-based approaches are not widely employed in clinical practice for two reasons: 1) the medical model has a longstanding history within psychology, perpetuating the focus on symptomology, diagnosis, and mental illness, and 2) there is very little consensus within the literature about what constitutes a strength (Coie et al., 1993; Seligman, Steen, Park & Peterson, 2005). This lack of clarification has led to a multiplicity of definitions and operationalizations of strength constructs (Engel, 1977; Luthar, Cicchetti & Becker, 2000; Maddux, 2002). Further explanation is needed to ensure future improvements in strength-based practice and its use within clinical settings. It is important, then, to review the strengths-based

literature to solidify a uniform definition and conceptualization of what strengths are in the context of therapeutic intervention.

The current study revolves around one central notion; clinical research as it relates to research regarding therapeutic alliance, change, and treatment outcomes is extremely limited with respect to evaluating the effects of client strengths on therapeutic processes. For these reasons, specific aims of the present study are to examine the effects of therapeutic alliance on therapy outcomes over the course of child/adolescent treatment, as well as the impact of self-reported strengths on these therapeutic processes.

CHAPTER II

LITERATURE REVIEW

History of Strength-Based Approaches

Prior to World War II, the three major goals in the field of psychology involved curing mental illness, making the lives of people more productive and fulfilling, and identifying and nurturing talent (Seligman, 2002). The last two goals ultimately emphasized the importance of individual strengths and focusing on positive outcomes in all populations; however, post-war conditions were not conducive for strengths-based psychological practice (Maddux, 2002). The U.S. Department of Veterans Affairs (VA) and the National Institute of Mental Health (NIMH), founded in 1946 and 1947, respectively, began to fund research solely dedicated to understanding psychopathology as opposed to individual assets (Gillham & Seligman, 1999; Peterson & Seligman, 2004). These events were precursors to the field's acceptance of the medical model approach to diagnosis and treatment; the position that mental illness and disorders should be treated like a medical disease (Maddux, 2002). Although many have argued against the model's utility in the field of psychology, the medically-oriented ideology has endured for the last sixty years, giving little regard to the importance of identifying human strengths (Engel, 1977; Maddux, 2002; Seligman & Csikszentmihalyi, 2000). The use of strength-based approaches in clinical psychology regained momentum following the emergence of prevention science and positive psychology.

Prevention Science. The American Psychological Association (APA) Task Force published a national call in 1993 encouraging researchers and practitioners to comprehensively study potential risk and protective factors associated with mental illness (Coie et al., 1993, p. 1013). The authors labeled this new field "prevention science," whose ultimate goal was to

develop and disseminate universal interventions targeted towards preventing and/or mitigating "major human dysfunction" across broad populations. (Coie et al., 1993, p.1013; Coie, Miller-Johnson, and Bagwell, 2000). Researchers were encouraged to closely examine possible precursors (i.e., risk and protective factors) that can predict further development, as well as prevalence and etiology, of existing disorders (Coie et al., 1993).

This conceptual framework promoted the utility of rigorous developmental research methodology to identify: (1) predictors, outcomes, and mediators of specific disorders, (2) how individual and environmental risk/protective factors interact across time, (3) models of character development, social functioning, and protective factors (i.e., psychological resilience and strengths), and (4) evidence-based interventions to address these concerns (Coie et al., 1993; Coie, Miller-Johnson, and Bagwell, 2000; Holden & Black, 1999). Although the term "prevention science" was new to the field of psychology, the study of buffers against mental illness was not. The APA's push for increased prevention practice was, in part, a response to the culmination of ground-breaking research in developmental trajectories of psychopathology with specific regard to risk and resilience-related processes (Coie et al., 1993; Hawkins, Jenson, Catalano, & Lishner, 1988; Rolf, Masten, Cichetti, Neuchterlein & Weintraub, 1990; Rutter, 1980, 1987).

Resilience. Roughly forty years before the advent of prevention science, Norman Garmezy (1952a, b) began studying the course and associated symptomology of schizophrenia in adults. With growing interest in developmental psychopathology, his research would later examine the effects of maternal diagnosis (e.g., schizophrenia, depression, personality disorders, etc.,) on developmental risk trajectories of their children (Garmezy, Masten, & Tellegen, 1984; Rolf & Masten, 1992). The evidence indicated that, despite the hereditary nature of these

disorders, there were high-risk (i.e., highly susceptible to acquiring the disorder) children who appeared to be "immune" to developing any severe psychopathology (Garmezy, 1981; Garmezy & Streitman, 1974; Garmezy, Masten, & Tellegen, 1984). He would ultimately coin the term "stress-resistant" children, which was later defined as children being largely unaffected by maternal diagnoses of mental disorders (Garmezy 1982). These studies led to a plethora of developmental research identifying both risk and protective factors, like resilience and emotional/behavioral strengths, across the lifespan, while also providing a framework for developing evidence-based preventative treatment that was later emphasized by the prevention science movement in 1993 (Cichetti, 1984; Crnic & Greenberg, 1990; Cummings & Davies, 1994; Rutter, 1987; Scarr, 1992; Werner & Smith, 1982;). Later studies would use terms such as "invulnerable" to describe children that possessed such phenomenological characteristics (Anthony, 1974). Finally, in 1982, Emmy Werner and Ruth Smith would introduce the phrase "resilient children," suggesting that protective factors that constitute resilience functioned through both internal (i.e., individual characteristics) and external (i.e., systemic influences) mechanisms (p. 4). These findings laid the foundation for conceptualizing resilience, protective factors, and other related processes in child populations (Cowen, 1985; Garmezy, 1985; Luthar, 2006; Masten, 2001; Rutter, 1985).

Unfortunately, multiple inconsistencies across both resilience theory and the conceptualization of resilience are prevalent in the literature (Luthar, Cicchetti & Becker, 2000). Foremost, there are three different models utilized in research to explain the construct of resilience, each of which describe how resilience differentially impacts risk factors, as well as negative and positive outcomes (Luthar, Cicchetti & Becker, 2000; Fergus & Zimmerman, 2005; Zimmerman, 2013). First, the compensatory model suggests that protective factors independently

affect outcomes regardless of associated risk factors (Fergus & Zimmerman, 2005; Garmezy, Masten & Tellegen, 1984). To illustrate, if a child who faces poverty and predispositions for mental disorders still becomes a successful adult later in life, then he/she has experienced the compensatory effects of resilience (Garmezy, Masten & Tellegen, 1984). Second, the protective factor model dictates that protective factors moderate risk factors directly, which subsequently affects negative outcomes (Garmezy, Masten, & Tellegen, 1984; Luthar, Cicchetti, & Becker 2000). For example, competent parents (protective factor) often take measures to prevent risk exposure, which ultimately lessens the number of adverse life events (risk factor) and leads to better long-term outcomes for their children (Masten, et al., 1999). Lastly, the challenge model proposes that exposure to a low number of adverse events can allow an individual to develop appropriate coping mechanisms, and overcome their struggles (Rutter, 1987).

Further, theorists argue over the definition, and, thus, operationalization, of the construct of resilience (Luthar, Cicchetti & Becker, 2000). Some suggest that resilience, or ego-resiliency, is a personality trait describing one's ability to modify ego structures to accommodate specific contexts (Block & Block, 1980). Others say that resilience is merely just "bouncing back" from stress, and returning to normal functioning (Agnes, 2005; Smith et al., 2008). The most widely accepted definition considers resilience to be a dynamic process that encompasses responding adaptively to adverse life events (Luthar, Cicchetti & Becker, 2000; Luthar & Zigler, 1991; Masten, Best & Garmezy, 1990). Identified factors associated with resilience vary widely across the literature because of these inconsistencies; regardless, global factors commonly associated with negating risk and promoting positive outcomes include familial and community support systems, parental resources, social-emotional competence (e.g., self-regulation and interpersonal skills), and positive views of the self (Garmezy, 1985; Masten, 2001; Wyman et al., 1999).

General disagreement in the resilience literature has hindered the development of a unified language and resulted in a lack of comparable research for determining the efficacy and effectiveness of interventions that claim to promote resilience. As such, there are few rigorously tested resilience-based assessments and interventions (Luthar, 2006; Luthar, Cicchetti & Becker, 2000). To address these concerns, Luthar and colleagues (2000) stress the importance of explicit clarification of the theory and definition used when referencing resilience-related processes in research. In relation to strength-based approaches, the term resilience is best defined as "a dynamic process of adaptive responding to significant adversity" (Luthar, Cicchetti & Becker, 2000, p. 543). Acceptance of this definition is determinant upon two conditions: (1) there is significant risk exposure (e.g., community violence, maternal depressive diagnoses, low income), and (2) there is positive adaptation (e.g., a response to adversity that is better than what it is expected to be under those circumstances, or social competence; Luthar, 2006; Margolin & Gordiss, 2000; Masten, 2001; Masten & Coatsworth, 1998). In other words, positive adaptation can manifest itself as individualistic strengths-based processes. Consistent with this conceptualization, the protective factor model is the most appropriate theoretical stance of resilience regarding strengths-based literature.

It should be noted here that much of the resilience literature is exclusively studied in children; the adult literature is incredibly sparse (Luthar, 2006). Developmental research in resilience oftentimes focuses solely on *outcomes* in adulthood (i.e., health, positive adjustment, social competence etc.,) rather than measuring and operationalizing the construct itself in adult populations (Sampson and Laub, 2003; Werner & Smith, 1982). Luthar (2006) posited that the discrepancy between the child and adult literature may be due to differences in language and terminology. She suggested constructs such as "character strengths," utilized in positive

psychology, generally measure what current researchers consider "adult resilience;" further, adult outcomes examine constructs, such as well-being, life satisfaction, and happiness, while developmental studies of resilience in children focuses on social competence, or their ability to behave and respond appropriately in society, today (Luthar, 2006; Peterson & Seligman, 2004).

Positive Psychology. The official origins of the positive psychology ideology should be attributed to Dr. Martin Seligman's 1998 presidential address to the American Psychological Association (APA), which emphasized the importance of building and promoting human strengths, well-being, and mental health. He proposed that psychology should redirect its focus towards positive practice in therapy to highlight individual strengths alongside their weaknesses (Seligman, 1998). Derived, in part, from mid-twentieth century studies of character traits and the ideals of prevention science (i.e., studying protective factors and strengths-based variables), the aim of positive psychology is to study *character strengths*, such as humor, love, wisdom, happiness, etc., and understand how to utilize these client characteristics for developing preventative and therapeutic interventions that heighten overall well-being (Seligman & Peterson, 2003).

Humanistic theorists fervently argue, though, that positive psychology lends much of its theoretical conceptualization to humanistic principles, but, more importantly, they maintain that positive psychology does not rightly credit the forefathers of the humanistic framework like Abraham Maslow and Carl Rogers. Humanistic scholars continually reiterate that the term *positive psychology* was first referenced by Abraham Maslow (1954) as a chapter titled "Toward a Positive Psychology" in his book *Motivation and Personality*. He briefly implicated the importance of understanding and promoting human potential, advocating for clinical psychology to focus on and facilitate positive aspects of the human experience (Maslow, 1954). However,

Maslow later omitted this chapter from subsequent editions, conceding that other psychological theories (i.e., humanistic, Rogerian, etc.,) may be better prospects for understanding these processes (Maslow, 1954; p. xxiii). Other notable psychologists, like Marie Jahoda (1982; 1958), suggested a need to define "positive mental health," but, she too, would abandon this research to study human relations and unemployment in the context of social psychology. Many critics of modern positive psychology cite such works as the foundation of this movement, but psychologists, like Maslow and Jahoda, had little interest in pursuing such constructs. Additionally, Peterson and Seligman (2004) discuss, at length, how previous works by Maslow, and other prominent psychologists (i.e., Carl Rogers, Erik Erikson, Lawrence Kohlberg, Marie Jahoda etc.,), greatly influence positive psychology and its conceptualization of strengths. Despite such acknowledgments, though, positive psychologists still contend that the field's ideology differs from humanistic psychology across several important dimensions (Seligman & Csikszentmihalyi, 2000; Waterman, 2013).

Firstly, humanistic theory is rooted within existentialism and phenomenology; ideals concerned with the meaning of life and the essence of being (Waterman, 2013). Maslow (1954) and Rogers (1959) built upon these concepts by suggesting that a meaningful life can only be attained through the growth of unique phenomenon (i.e., self-actualization, love, creativity, etc.,), and that they can be cultivated through the relationship between therapist and client in psychotherapy. It is clear that phenomena, identified within humanism, are similar to that of human strengths in positive psychology; however, the theoretical orientations differ in how they conceptualize strengths and the means by which to achieve the associated positive outcomes (Froh, 2004; Waterman, 2013). For example, Maslow's hierarchy of needs suggest that self-actualization is the "the full use and exploitation of talents, capacities, [and] potentialities;

further, he claims that such a need cannot be fulfilled until all other needs (e.g., physiological, safety, love, esteem) are met (Maslow, 1970, p.150). On the contrary, positive psychologists believe that all people harbor human strengths, and do not propose that fulfillment of other needs precede access to and utilization of these strengths (Peterson & Seligman, 2004; Seligman & Csikszentmihalyi, 2000). Carl Rogers (1995; 1951) also proposed that client-centered therapy was a means to achieve self-actualization. He asserted that qualities of the therapist, like congruence (i.e., wholeness within the therapist), unconditional, positive regard, and empathic understanding, allowed the client to reach their full potential in therapy. Positive interventions, on the other hand, focus on increasing individual happiness across three different dimensions: positive emotion, engagement, and the meaningful life (Seligman, Steen, Park & Peterson, 2005). Specifically, client-centered therapy focuses on therapist characteristics (i.e., therapist style), while positive interventions emphasize client characteristics (i.e., strengths) to achieve self-actualization and/or the meaningful life.

Secondly, positive psychology researchers highlight the lack of methodological rigor within humanistic research, such allegations accuse humanistic studies of not utilizing enough empirical evidence to support humanistic theory (Friedman, 2008; Seligman & Csikszentmihalyi, 2000; Waterman, 2013). Giorgi (2009) proposed that empiricism was not the best way to study the intersection of phenomenology, science, and psychology, but rather qualitative analyses are ideal for studying the subjective experience of being and making meaning in life (Giorgi, 2009). For these reasons, positive psychologists contend that constructs identified within the humanistic literature are, too, subjective by nature, and, thus, not consistent nor generalizable across situations and populations (Seligman & Csikszentmihalyi, 2000; Waterman, 2013).

Seligman and Peterson's (2003) ultimate hope was to create a classification of strengths that were empirically supported, so that identification and development of human strengths could be of used in treatment (Peterson & Seligman, 2004). Some critics purport that positive psychology completely ignores mental illness and its treatment, disregarding decades of empirical research on psychopathology (Diener, 2009). Positive psychologists, however, emphatically maintain that the key objective of strength-based assessment and intervention is not to diminish the importance of identifying deficits and preventing mental illness, but rather to give equal attention, in research and practice, to conceptualizing and using individual strengths for health promotion (Diener, 2009; Peterson, 2009; Seligman & Peterson, 2003).

Character strengths. In 2003, Seligman and Peterson identified several important criteria that define or describe "strengths:" (1) they are trait-like, stable across situations and time, (2) they are valuable in their own right, regardless of obvious benefits, (3) parents try to instill strengths within their children, (4) society provides many opportunities to develop strengths, (5) cultural parables and role models demonstrate strengths relevant to that culture, (6) there are individuals who acquire strengths earlier, and utilize them at much more sophisticated levels, indicating genius or prodigy in strengths, and (7) core strengths are valued across cultures. Further, they suggested a need for a supplementary manual of strengths that would be comparable to those that focus on mental illness, such as the Diagnostic and Statistical Manual of Mental Disorders (DSM; American Psychological Association, 1952, 2013; Seligman & Peterson, 2003).

To create this classification system, Peterson and Seligman (2004) developed a character strengths framework employing elements from many different psychological theories. Mid-twentieth century psychologists like Edward Thorndike (1940), Erik Erikson (1963, 1968), and

Warren Norman (1963) wrote extensively on human virtues and personality traits across their respective fields (Peterson & Seligman, 2004; Seligman & Peterson, 2003). More modern constructs like resilience, values (i.e., shared conceptions of what is good or desirable), and moral development (i.e., learning differences between good and bad, lawful and unlawful, etc.,) were also considered when constructing this catalogue (Kohlberg, 1984; Masten, 2001; Schwartz, 1992). Thorough analyses of these and several other psychological theories, as well as historical literature and philosophy ideologies across cultures, resulted in a classification system that identified six overarching domains of "virtue," each with several subdomains that are considered character strengths (Peterson & Seligman, 2004). Peterson and Seligman (2004) define virtues as "core characteristics valued by moral philosophers and religious thinkers," and character strengths as "the psychological ingredients—processes or mechanisms—that define those virtues" (p. 13). The six domains of virtue include wisdom and knowledge, courage, humanity, justice, temperance, and transcendence (Peterson & Seligman, 2004; Seligman & Peterson, 2003).

First, the virtues of wisdom and knowledge are described as the cognitive strengths that encompass acquiring and utilizing knowledge (Peterson & Seligman, 2004; Seligman & Peterson, 2003). Accordingly, the five character strengths that define this virtue are creativity, curiosity, open-mindedness, love of learning, and perspective (Peterson & Seligman, 2004). Second is the virtue of courage, or those emotional strengths that consist of exercising one's will to achieve their goals in the face of opposition (Peterson & Seligman, 2004; Seligman & Peterson, 2003). The associated character strengths of this virtue are bravery, persistence, integrity, and vitality (Peterson & Seligman, 2004). Third, the virtue of humanity, or the interpersonal strengths that allow people to befriend others, encompasses the three strengths of

love, kindness, and social intelligence (Peterson & Seligman, 2004; Seligman & Peterson, 2003). Fourth, the virtue of justice is described as the civic strengths involved in a healthy community life; the associated strengths include citizenship, fairness, and leadership (Peterson & Seligman, 2004; Seligman & Peterson, 2003). Fifth is the virtue of temperance; the strengths that protect against excess, such as forgiveness and mercy, humility and modesty, prudence, and self-regulation and control (Peterson & Seligman, 2004; Seligman & Peterson, 2003). The sixth and final virtue is that of transcendence, the strengths that provide meaning to life, and the acceptance that people are connected to some much bigger than themselves (Peterson & Seligman, 2004; Seligman & Peterson, 2003). The five strengths that define transcendence are appreciation of beauty and excellence, gratitude, hope, humor, and spirituality (Peterson & Seligman, 2004). Overall, this classification system contains a comprehensive list of virtues and subsequent character strengths that are experienced in adulthood.

In contrast to the resilience literature, the majority of this work has focused much more on adult populations (Peterson & Seligman, 2004). The conceptual framework of character strengths heavily borrowed from trait theory (i.e., the Big Five taxonomy), based in the field of personality psychology (Peterson & Seligman, 2004; Saucier & Simonds, 2006). Personality traits have been extensively studied in adult literature, but research regarding personality structures in childhood are very rare (Costa & McCrae, 1990; Field & Millsap, 1991). Currently, developmental researchers examine *temperament* in children rather than personality traits that are often studied in adults; this may explain the lack of literature regarding trait conceptualization in developmental research (Oliver & Srivastava, 1999). Likewise, the present framework that was heavily influenced by trait theory, followed suit, and specifically focused on adult populations at that time (Peterson & Seligman, 2004).

The developers of the classification system acknowledged the need for longitudinal studies regarding these constructs (Peterson & Seligman, 2004). In 2003, Steen and colleagues conducted focus groups of high school students to better understand the character strengths that adolescents considered important. This work subsequently led to the development of the Values in Action Inventory of Strengths for Youth (VIA-Youth), which was adapted for adolescents (ages 10-17) from the original, adult-oriented inventory created in 2004 (Park & Peterson, 2005; Park & Peterson, 2009; Peterson & Seligman, 2004). To date, the literature suggests that child and adolescent character strengths predict a number of positive outcomes, such as positive school adjustment in younger children, higher school performance, better school social functioning, higher levels of perseverance and community connectedness, fewer self-reported depressive symptoms, and higher self-reported levels of well-being and happiness (Seider, Novick & Gomez, 2013; Shoshani & Ilanit Aviv, 2012; Shoshani & Slone, 2012; Toner, Haslam, Robinson, & Williams, 2012; Weber, & Ruch, 2012).

Comparison of Strengths across Fields

Positive psychologists and resilience researchers are often quick to argue the differences across these two disciplines (Luthar, 2006; Peterson & Seligman, 2004). It is clear that, theoretically, the frameworks of resilience and character strengths were initially developed to study different populations (i.e., children, adolescents, and adults; Luthar, 2006; Peterson & Seligman, 2004). However, research over the last twenty years suggests that character strengths do occur in childhood, and are related to a number of positive outcomes (Seider, Novick & Gomez, 2013; Shoshani & Ilanit Aviv, 2012; Shoshani & Slone, 2012; Toner, Haslam, Robinson, & Williams, 2012; Weber, & Ruch, 2012).

Researchers and practitioners willingly acknowledge that there are some commonalities across fields; however, there is an argument to be made concerning the abundant similarities between strengths-related constructs (Luthar, 2006; Peterson & Seligman, 2004). First, Peterson and Seligman (2004) define the virtue of humanity as "interpersonal strengths that involve tending and befriending others;" in the same manner, the resilience literature also identifies social competence (i.e., the ability to develop meaningful interpersonal relationships) as an important factor that impacts positive outcomes (Masten & Coatsworth, 1998). Second, the virtue of temperance, or the "strengths that protect against excess," like self-regulation, appears quite similar to the emotion regulation component identified in the resilience literature (Campbell-sill & Barlow, 2007; Peterson & Seligman, 2004, p. 30; Tugade & Fredrickson, 2007). Emotion regulation is the ability to regulate one's emotions despite physically and mentally demanding circumstances; this construct is often associated with social competence, as previously mentioned (Gross, 2014; Wyman et al., 1999). Lastly, the virtue of courage, defined as "emotional strengths that involve the exercise of will to accomplish goals in the face of opposition" could arguably be comparable to one's ability to accept change as identified in factor analyses of popular resilience measures (Peterson & Seligman, 2004; p. 29). It is of utmost importance to have, both, well-defined conceptualizations of strengths and uniform language so that practitioners may appropriately and consistently utilize formal strengths-based approaches in the field.

The developmental assets framework, relating to health promotion in adolescents and, subsequently, the communities in which they are situated, is worth mentioning here. Much like resilience and character strengths research, the developmental assets literature suggests that there are 40 internal (e.g., commitment to learning, positive values, social competence, positive

identity) and external (e.g., support, empowerment, boundaries and expectations, constructive use of time) assets that adolescents (specifically age 12-18) can possess and develop to promote overall well-being or "thriving (Leffert et al., 1998; Scales, Benson & Leffert, 2000, p. 28)." This body of literature, though, differs from other strength-based research in its focus on the adolescent within the community system or setting, and emphasizes that health promotion in adolescents betters overall community health (Benson, 2003; Schwartz, Chan, Rhodes & Scales, 2014). Many public health practitioners indicate that focusing on individual-level factors detract from the focus of community health promotion (Israel, Schulz, Parker & Becker, 1998). Further, the public/community health literature appears to focus primarily on issues regarding access to health care, promotion of positive health behaviors, and inequities within the system that affect such areas (Israel, Schulz, Parker & Becker, 1998; Search Institute, 2017). Specifically, within the developmental assets framework, there is a greater emphasis on reducing risky behaviors (i.e., drug and alcohol use, sexual behavior) to promote thriving across systems (e.g., school success, valuing diversity, help others; Search Institute, 2017). In contrast, strength-based practices, as indicated within this review, aim to utilize child and adolescent strengths to promote well-being solely in the context of the individual (Coie et al., 1993; Seligman, Steen, Park & Peterson, 2005)); thus, further study of developmental assets is neither necessary nor appropriate within the scope of clinical research.

Formal Strength-Based Approaches in Practice

Measures that solely assess strengths are rarely used in clinical practice; positive psychologists maintain that information concerning deficits is still needed to gain a holistic perspective of current functioning (Diener, 2009; Seligman & Csikszentmihalyi, 2000). To ensure that assessments are comprehensive, some behavior rating scales address areas of both

emotional and behavioral strengths and weaknesses with much larger focus on deficits (e.g., Behavior Assessment Scale for Children [BASC], Behavioral and Emotional Rating Scale [BERS]; Epstein, 2004; Reynolds & Kamphaus, 2015). Regardless of whether the strengths are measured or not, this still cannot be considered formal strength-based practice, because the strengths are not utilized in any manner to inform the practitioner of appropriate intervention strategies to decrease symptomology or increase already positive functioning (i.e., therapeutic outcomes).

Evidence-based practice standards strongly encourage clinicians to gather information on client strengths through clinical interviewing as a part of both the assessment and counseling process; Regardless of implementing these practices during the interview, many clinicians do not know how to incorporate strengths into treatment planning, and, additionally, empirically-supported interventions do not clarify how to utilize individual strengths in treatment (Anderson, 2006; Beck, 2011; Kazdin & Weisz, 1998; Peter & Scott, 1995; Tedeschi & Kilmer, 2005). Further, even less research is available regarding how the individual's strengths impact the therapeutic alliance or overall therapeutic outcomes directly (Cox, 2006).

Clinical Research

Psychotherapeutic outcomes have been extensively studied using two specific methodologies: efficacy and effectiveness research (Lambert, 2001; Lambert, Hansen, & Finch, 2001; Lutz, 2003). Traditionally, these two methodologies aided researchers in determining which empirically supported treatments are associated with change in clinical therapy across a variety of psychological disorders (Howard, Moras, Brill, Martinovich, & Lutz, 1996). Efficacious research rigorously assesses clinical interventions in controlled settings (i.e., clinical trials), while effectiveness studies examine these same interventions in naturalistic settings so as

to mimic "real-world" conditions; each of which has provided invaluable support for the use of many evidence-based treatments (Nathan, 1998). However, some scholars emphasize that clinical trials are not generalizable to real-life settings, and that effectiveness studies typically lack internal validity (Lambert, 2001). In conjunction with such limitations, though, a number of researchers ardently argue that neither methodology addresses the most disconcerting question psychologists face today: "Is my therapeutic approach working for this particular patient (Howard, Moras, Brill, Martinovich, & Lutz, 1996; Lambert, 2001, p. 147; Lutz, 2003)?"

Patient-Centered Research. It is well known in the treatment outcomes literature that even meticulously validated interventions do not work for every single individual, even if it is simply due to extraneous variables (Drake et al., 2001, Howard, Moras, Brill, Martinovich, & Lutz, 1996; Woolf, Grol, Hutchinson, Eccles, & Grimshaw, 1999). Howard and colleagues (1996) proposed that patient-centered research uses the voice of the patient to assess the effects of treatment (Lambert, Hansen, & Finch, 2001; Mearns & McLeod, 1984; Selby, Beal, Frank, 2012). While prior outcomes studies utilized pre-post data, patient-focused approaches measure therapeutic outcomes through a continuous collection of patient progress data; information regarding status of well-being, interpersonal relationships, as well as social and/or life functioning (Howard, Moras, Brill, Martinovich, & Lutz, 1996; Lambert, Hansen, & Finch, 2001; Overington & Ionita, 2012).

Not only does this type of data collection provide a unique, individualized picture of how clients respond to a given intervention, it also provides valuable feedback to practitioners who can then utilize clinical expertise to determine the course of treatment (i.e., how long treatment should last, the best next step, and the optimal time to terminate (Howard, Moras, Brill, Martinovich, & Lutz, 1996; Lambert, Hansen & Finch, 2001). Lambert and colleagues (2001)

found that this type of patient profiling gives clinicians practical and immediate feedback regarding how patients are progressing in therapy. The evidence suggests that patients of clinicians who were given this feedback stayed longer in therapy, and had, overall, better therapeutic outcomes (i.e., lower symptomology, better interpersonal relationships, and high social functioning; Lambert, Hansen & Finch, 2001).

Although there are little to no studies currently available that specifically look at strength-based variables, like resilience or character strengths, in relation to psychotherapeutic outcomes, a major area of focus within the clinical literature is the concept of therapeutic alliance. In relation to patient-centered research, though, therapeutic alliance is often understudied, and lacks methods that focus on longitudinal data to better understand how therapeutic alliance develops across the span of treatment.

Therapeutic Alliance. Notions of the therapeutic alliance have a long-standing history within clinical psychology (Safran & Muran, 2000). The impetus of its study began with Sigmund Freud (1912), who posited that the therapeutic relationship was closely intertwined with transference, meaning the "displacement of affects from one object or person to another" (Safran & Muran, 2000, p. 7). Such concepts laid the foundation for the work of many later psychoanalysts, who believed that the therapeutic relationship was a means for reliving past trauma and should be used to develop resolution (Balint, 1968; Ferenczi, 1995). In 1940, however, Richard Sterba was the first to offer a more instrumental conceptualization of therapeutic alliance, comparable to today's standards— a positive relationship between client and therapist that would lead to more agreement in not only the appropriateness, but, also, the completion of tasks in therapy.

In the late 70's to early 80's, there was an influx of research dedicated to understanding not just the quality of the therapeutic relationship, but also the alliance between therapist and client (Safran & Muran, 2000). Bordin (1979) suggested that there were three components that contributed to "alliance": tasks of therapy, goals of therapy, and the bond between patient and therapist. Tasks of therapy involve the activities that client's engage in, the goals are the objectives that both client and therapist agree upon and endorse throughout treatment, and, lastly, the bond refers to the positive attachment between client and therapist, involving "mutual trust, confidence, and acceptance (Bordin, 1979; Lambert & Barley, 2001, p. 358). Further, Bordin (1979) posited that higher agreement between therapist and client on these variables was indicative of higher quality therapeutic alliance. Current measures of therapeutic alliance rely heavily on this conceptualization (Duncan et al., 2003; Horvath & Greenberg, 1989; Lambert & Barley, 2001).

Much of the clinical research literature suggests that there is some connection between therapeutic alliance and therapy outcomes. Early meta-analytic reviews have indicated that, across both adult and youth studies, the correlation between the two variables is relatively small (correlation r=.22; Bickman et al., 2004; Martin, Garske, & Davis, 2000; Shirk & Karver, 2003). Research within the adult literature has suggested that the alliance is in and of itself therapeutic, which may explain its impact on therapy outcomes (Henry & Strupp, 1994; Martin, Garske, & Davis, 2000). The few studies that have focused on these processes in children and adolescents agree that the relationship appears to be almost identical to that of adult studies (Bickman et al., 2004; Shirk & Karver, 2003). Even though the literature base is small, several factors have been shown to impact the relationship between therapeutic alliance and subsequent outcomes within child and adolescent studies. For instance, Bickman et al. (2004) compared self-reported and

counselor-reported therapeutic alliance on therapy outcomes. Little to no correlation was indicated between both reports, but, interestingly, they did find that, of "youth" between the ages of 9-20, those under the age of 17 reported the therapeutic alliance as more negative in comparison to counselor reports of alliance; further, those at 17 reported similarly to counselors, and those older than 17 reported therapeutic alliance more positively than respective counselors (Bickman et al., 2004). No other youth characteristics were found to affect alliance and/or outcomes (Bickman et al., 2004). Although the authors do not make any additional assumptions about these findings, it is possible that age may be a covariate in the relationship between therapeutic alliance and outcomes. Further, Bickman and colleagues (2004) demonstrated the utility of collecting longitudinal data concerning therapeutic alliance, as well as promoting the need for continual data collection to provide feedback to clinicians.

Another study, conducted by Shirk and Karver (2003), analyzed a plethora of variables (e.g., patient age, type of problems, treatment type and mode, target relationship, level of treatment structure, treatment context, etc.,) and their moderating effect, or lack thereof, on therapeutic alliance and psychotherapy outcomes. Of note, only one variable related to patient characteristics moderated the association between therapeutic relationship and outcomes: symptom type of patient (Shirk & Karver, 2003). The results indicated that whether the child experienced internalizing or externalizing symptomology impacted overall association (Shirk & Karver, 2003). Historically, treatment engagement and alliance has been shown to be particularly difficult with externalizing children, moreover, adult studies show similar results in terms of hostility levels (Henggeler, Schoenwald, Borduin, Rowland, & Cunningham, 1998; Horvath & Luborsky, 1993; Shirk & Karver, 2003). If this is true for symptoms, like externalizing behavior, then is it possible for the inverse effect to occur with individual strengths? Strengths related to

social competence suggest that some individuals excel in relationship building and connecting with others (Masten & Coatsworth, 1998; Peterson & Seligman, 2004). It seems possible, then, that those who have strong interpersonal skills may develop a better alliance with their therapist, and, thus, achieve more positive outcomes post-treatment. Scholars have encouraged further study of those client characteristics that potentially impact treatment outcomes (Karver, Handelsman, Fields, & Bickman, 2005).

In 2005, Karver and colleagues proposed the therapeutic treatment process model, which identified possible relationship variables that affect overall treatment outcomes. The model posited that there were 11 possible relationship-related variables that impacted therapeutic outcomes (e.g., client and therapist characteristics, client and therapist perceptions of each other, client autonomy, therapist self-disclosure, etc.; Karver, Handelsman, Fields, & Bickman, 2005). The authors proposed that client pretreatment characteristics partially impacted therapists' behaviors, the therapeutic alliance, and subsequent treatment outcomes (Karver, Handelsman, Fields, & Bickman, 2005). Although not in the context of strengths-based literature, some prior research supports that client interpersonal style (i.e., pretreatment characteristics) leads to therapists' differential responses towards clients in therapy; specifically, therapists changed their style of therapy dependent upon the initial level of motivation of clients (Hardy, Stiles, Barkham, & Startup, 1998; Karver, Lambert, & Bickman, 2003).

To further establish the accuracy of their model, Karver and colleagues (2006) conducted a meta-analysis to study the effects of those proposed therapeutic relationship variables on family and youth therapy outcomes. Of the 49 treatment studies analyzed, they found that youth characteristics like willingness to participate and actual participation heavily impacted treatment

outcomes. Unfortunately, no other client pretreatment characteristics were measured (Karver, Handelsman, Fields, & Bickman, 2006).

It should be emphasized here that the effects of pretreatment client characteristics on therapeutic alliance and overall outcomes is understudied. More specifically, there is essentially no research regarding the impact of strength-based, positive characteristics on these processes. As previously discussed in the current review, contemporary strengths-related research showcases the potential utility of strengths identification within clinical settings (Coie et al., 1993; Seligman, Steen, Park & Peterson, 2005). However, promotion of strength-based practice in clinical assessment and therapy requires a better understanding of the specific role, if any, individual strengths play in these therapeutic processes.

Gaps in the Literature

The purpose of the current study is to better understand how adolescents' unique strengths impact several therapeutic processes. The effects of therapeutic alliance on psychotherapy outcomes varies across the clinical literature and warrants further study in its own right (Krupnick et al., 1996; Nordgren, Carlbring, Linna, Andersson, 2013; Orlinsky, Rønnestad, & Willutzki, 2004). Most importantly, though, the causal relationship between therapeutic alliance and therapy outcomes are often studied by assessing alliance at one time point (e.g., early middle, late, averaging) during treatment; however, such methods may not accurately capture the true nature of this relationship (Barber, Connolly, Crits-Christoph, Gladis, & Siqueland, 2000; Horvath, Del Re, Fluckiger & Symonds, 2011; Kazdin & Nock, 2003). To address these concerns, Kazdin and Nock (2003) suggested studying the effects of therapeutic alliance on symptom change across multiple time points over the span of treatment; only one prior study has studied such trajectories. Barber and colleagues (2000) concluded that alliance

did indeed significantly predict further symptom improvement across the span of treatment. However, they also found that patients who experienced immediate improvement after the start of treatment developed a stronger bond with their therapist, and, subsequently, had more positive outcomes (Barber, Connolly, Crits-Christoph, Gladis & Siqueland, 2000). Patient-centered research has showcased the utility of longitudinal data analysis with therapeutic outcomes, such methods should extend to the alliance-related research. Further study of alliance and outcomes through longitudinal analytical methods is necessary to fully understand the causal role of alliance on therapy outcomes throughout the entire span of clinical treatment.

As previously mentioned, symptom type has been shown to be correlated with alliance development and positive outcomes in therapy (Shirk & Karver, 2003). There is little to no empirical support, though, concerning how other client characteristics, like individual strengths, affect these processes. Findings from the current study aim to shed light on the possible relationship between self-reported adolescent strengths on therapeutic alliance and therapy outcomes. More importantly, the implications of this research can lend to the literature regarding the use of strength-based data to inform treatment planning, mitigating risk factors and negative symptoms while increasing positive aspects of overall human functioning (Cox, 2006). For these reasons, this study poses three questions: (1) how do self-reported strengths impact the quality of the therapeutic alliance, (2) does therapeutic alliance affect therapy outcomes throughout treatment, and (3) do those same strengths, on average, moderate the overall relationship between the therapeutic alliance and clinical therapy outcomes?

It is hypothesized that: (1) self-reported strengths will significantly impact the quality of the therapeutic alliance, (2) the rate of change in therapeutic alliance will be associated with a more positive trend in therapy outcomes across treatment, and (3) self-reported strengths will

moderate the relationship between therapeutic alliance and psychotherapy outcomes. Based on previous literature, age and symptom type (e.g., externalizing vs. internalizing) are identified covariates, and were controlled for.

CHAPTER III

METHODS

Procedures

Data were obtained through the Texas A&M Counseling and Assessment Clinic at the Community Health Clinic (CAC CHC) in Bryan, Texas, a non-profit training clinic supported by the Department of Educational Psychology at TAMU. The clinic offers both therapy and assessment services to the surrounding community. Service providers consist of doctoral students in the School Psychology and Counseling Psychology graduate programs. All student clinicians conduct counseling and assessment services while under the supervision of a university faculty member that is licensed in the state of Texas as a Licensed Psychologist (LP). Doctoral students receive both group and individual supervision throughout their training at the CAC CHC.

Interested clients begin the process by calling the clinic to schedule an appointment. Clients are required to participate in a confidential phone screening to gather personal and demographic information (i.e., contact information, race/ethnicity, income level, etc.,), as well as a short description of presenting problems or symptoms. Using a sliding-scale, service fees are determined based on income level and family size. Following completion of the phone screening, clients will either be assigned to a student clinician or put on a waitlist.

Prior to beginning the intake appointment, student clinicians explain each portion of the consent form to clients, and clients sign appropriate documents as acknowledgment of all clinic policies and procedures. The consent forms articulate that data collected in the CAC CHC may be utilized for archival research; however, agreement to this clause is optional. If clients allow the use of information for archival research, no further consent is necessary. All participants of the current study gave consent for data to be utilized for research, and the current study was

approved by the Institutional Review Board of human subject research at Texas A&M University. Following consent procedures, clients complete an intake questionnaire to provide more detailed information about presenting problems. For child and adolescent cases, student clinicians administer the Behavior Assessment System for Children (BASC; see full description of scale below) at the beginning of treatment. Measures of therapeutic alliance and therapy outcomes (also discussed later) are collected every therapy session held at the CAC CHC.

Altogether, there were four exclusion criteria for the current study. First, clients that were initially identified as in need of a higher level of care (e.g., suffering from severe major depressive disorder, bipolar disorder, or schizophrenia) during the screening process were referred out to other clinics, and, thus, excluded from the current sample. Second, clients had to have attended at least three or more sessions at the CAC CHC, which is the minimum number of data points necessary for accurately examining therapeutic change; as supported by previous alliance and outcome studies (Brown, Dreis, & Nace, 1999; Howard, Moras, Brill, Martinovich & Lutz, 1996; Miller, Duncan, Brown, Sparks & Claud, 2003). Third, the current study included only adolescents between the ages of 12-18. While the CAC CHC services children of all ages, previous research suggests that adolescents are consistent reporters of their own behavioral and emotional functioning in comparison to younger children. Lastly, the BASC self-report measures provide an index of socially desirable responding to account for self-report bias (Reynolds & Kamphaus, 2015; Reynolds & Kamphaus, 2007). To ensure that adolescents were providing an accurate report of their current functioning, participants that obtained high scores on the *L* index (e.g., >8) were excluded.

Participants

Based on these requirements, sufficient data were available for 58 participants with 871 total observations. Adolescents' average age at intake was 14 years (SD = 1.66), and 56.9% were female. Reported race/ethnicities were 51.7% Caucasian; 31% Hispanic; 8.6% Black; and 8.6% identified as multiracial. Full descriptive demographic data are presented in Table 1. Participants attended between 3 and 68 sessions with an average number of attended sessions at 16 (*SD* = 12.04; See Table 2).

Measures

Demographic Information. Personal and demographic information were acquired through a confidential phone screening and the intake questionnaire. The phone screening is conducted by a doctoral student service coordinator at the CAC CHC prior to scheduling an intake appointment. The intake questionnaire, on the other hand, is paper-and-pencil form that asks questions about the family structure, relevant medical or psychological history, developmental concerns, current symptoms, etc. It was developed solely for CAC CHC use. For under-age clients, it is typically completed by parent(s) and/or legal guardian(s), because they have a better understanding of child and adolescent developmental history.

Adolescent Strengths. The Behavior Assessment System for Children, Second and Third Edition (BASC-2 and -3; Reynolds & Kamphaus, 2015; Reynolds & Kamphaus, 2007) is a measure of emotional and behavioral strengths and difficulties in children, adolescents, and young adults, ages 2 through 25. Components of the system include rating scales for teachers (TRS), parents (PRS), and children/adolescents/college (self-report of personality; SRP), along with a structured developmental history (SDH) questionnaire and a student observation system (SOS). For therapy purposes, only the PRS and SRP forms are used at the CAC CHC.

The SRP form is intended for ages between 6-25 (child, 8-11; adolescent, 12-18; college, 19-25), and takes roughly 20-30 minutes to complete. The scale includes composite scores for Emotional Symptoms, Inattention/Hyperactivity, Internalizing Problems, Personal Adjustment, School Problems, and a total score. Respondents are asked to rate various sentences as being applicable to themselves, with ratings including "Never," "Sometimes," "Often," and "Almost Always." T-Scores (M=50, SD=10) are provided for each composite and scale based on combined gender norms. For clinical scales, scores between 40 and 60 are considered within the normal range, scores above 60 are indicative of at-risk/elevated levels of behavior, and scores above 70 are considered clinically significant. For the adaptive scales, scores between 40 and 60 are within normal limits, with scores below 40 are at-risk, and those below 30 are clinically significant. The BASC self-report form demonstrates good reliability. Alpha coefficients regarding the composites range from .91-.96 for adolescents age 12-14, and .90-.97 for adolescents age 15-18. Test-retest reliabilities reportedly range from .86 to .90 for all adolescents. There was no interrater reliability reported for the self-report form.

As previously indicated by this review, the current study focuses solely on adolescent self-report for two reasons: 1) prior adolescent studies have shown that age may be a potential covariate in the relationship between therapeutic alliance and overall outcomes in child/adolescent therapy, and 2) adolescents have shown to be reliable reporters of their own emotional and behavioral states (Bickman et al., 2004, Romer & Merrell, 2012). Researchers must be vigilant in regard to common method variance (i.e., biases due to the measurement method rather than the purported construct of interest); of particular concern for the current study is self-report bias and socially desirable responding (SDR; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Two ways to eliminate method biases include using multi-informant reports or assessing socially desirable responding (SDR; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Employing reports from multiple informants can be problematic, specifically within the context of child and adolescent clinical research. Both the BASC-2 and -3 indicate relatively low correlations across parent and adolescent reports of adaptive scales (See Table 3; further descriptions of scales are below); however, many scholars propose that the lack of consistency may not necessarily indicate that one respondent's report is right and that the other is wrong (Achenbach, McConaughy, & Howell, 1987). On the contrary, the literature emphasizes the importance of child and adolescent self-report as an essential piece in determining the overall functioning of the child/adolescent; specifically, researchers should not discredit individual descriptions of personal experience despite inconsistencies with parent reports (Achenbach, McConaughy, & Howell, 1987; Chang, P. & Yeh, C., 2004; Waters, Stewart-Brown, & Fitzpatrick, 2003). Thus, comparisons across informants are not necessarily the most appropriate method for correcting self-report bias in the context of the current study.

Fortunately, both the BASC-2 and -3 evaluate socially desirable responding (SDR), allowing evaluators to account for common method variance (Reynolds & Kamphaus, 2015; 2017). The *L* (lie vs. social desirability) index tallies the number of times the child/adolescent respondent reports an overly positive self-description for items that are mildly critical. For adolescent self-report, a range of items that are considered "Acceptable" are between 0-8 (approximately 93.9% of the normed sample responded consistently within this range). "Caution" and "Extreme Caution" descriptors of the *L* index suggest the possibility that respondents are responding in an overly positive (i.e., socially desirable) way, with the range occurring between 9-11 items and 12-15 items, respectively. Further, scores that should be

interpreted with caution and with extreme caution were endorsed by less 5% of respondents from the item-development samples (Reynolds & Kamphaus, 2015; 2017). Thus, to account for self-report bias, reported scores outside of the "Acceptable" (e.g., 0-8 items) range for the *L* index will be excluded.

Prior to 2015, the CAC CHC administered the BASC-2 to assess child and adolescent strengths and weakness. Upon publication of the most recent edition, the CAC CHC has since used the BASC-3. Scale scores between editions are highly correlated (See Table 4). These analyses indicate that the SRP-A (self-report of personality-adolescent) is highly correlated, and, thus, are comparable for research purposes.

Additionally, all items within the BASC-2 SRP forms were included in the BASC-3. To allow for score comparisons across editions, the authors developed a method for standardizing BASC-2 items to BASC-3 sample norms. The average differences in *T*-score units are reported in Table 5. To compare scores, the evaluator simply adds or subtracts (indicated by a negative number) the mean difference from the BASC-2 *T*-score to compute a standardized *T*-score based on BASC-3 norms. Score differences of 4 points approach a half standard deviation of difference, suggesting that the norming population for the BASC-3 included individuals who reported poorer adjustment than for those normed for the BASC-2. Score differences between 0-1 are not significant. The current study utilized this approach to ensure validity of score comparisons across editions.

Of particular interest to the current study is the Personal Adjustment composite scale score, which encompasses Interpersonal Relations, Relations with Parents, Self-Esteem, and Self-Reliance subscales. Each of these subscales reflects strengths identified within this review, and, thus, are appropriate measures of self-reported adolescent strengths (Kamphaus & Frick,

2005). For example, interpersonal skills are highlighted across both the resilience and character strengths literature (Garmezy, 1985; Masten, 2001; Peterson & Seligman, 2004; Wyman et al., 1999); familial support is an identified protective factor that affects positive outcomes in youth (Werner & Smith, 1982); and self-esteem and self-reliance are closely associated with the strengths of perseverance, self-regulation, and creativity within both positive psychology and prevention science (Garmezy, 1985; Peterson & Seligman, 2004). Further research supports the BASC as a valid measure of child/adolescent strengths and overall well-being (Kadish, Glaser, Calhoun & Ginter, 2001; Rashid, Anjum, Lennox, Quinlan, Niemiec, Mayerson & Kazemi, 2013; Solomon, Ono, Timmer & Goodlin-Jones, 2008; Woodland, Porter, & LeBuffe, 2011).

Symptom Type. The BASC-2 and -3 Parent Rating Scales for adolescents (PRS-A) will be used to assess symptom type in adolescents (Reynolds & Kamphaus, 2015; Reynolds & Kamphaus, 2007). The SRP-A does not currently include an index for externalizing symptoms; thus, the PRS-A will provide a metric for both internalizing and externalizing symptom presentation in adolescents. The PRS form is intended for parents and guardians of children between 2-21 (preschool, 2-5; child, 6-11; adolescent, 12-21), and takes roughly 10-20 minutes to complete. The scale includes composite scores for Externalizing Problems, Internalizing Problems, Adaptive Skills, and Behavioral Symptoms Index. Respondents are asked to rate various sentences as being applicable to the child/adolescent, with ratings including “Never,” “Sometimes,” “Often,” and “Almost Always.” T-Scores (M=50, SD=10) are provided for each composite and scale based on combined gender norms. For clinical scales, scores between 40 and 60 are considered within the normal range, scores above 60 are indicative of at-risk/elevated levels of behavior, and scores above 70 are considered clinically significant. For the adaptive scales, scores between 40 and 60 are within normal limits, with scores below 40 are at-risk, and

those below 30 are clinically significant. Like the SRP, the PRS is administered prior to the start of treatment at the CAC CHC. The BASC parent rating scale also demonstrates good reliability. Alpha coefficients regarding the composites range from .95-.97 for adolescents age 12-14 with a .97 for adolescents age 15-18. Test-retest reliabilities reportedly range from .92 to .94 for all adolescents. Interrater reliabilities for adolescents range from .77-.87.

Therapeutic Alliance. The Session Rating Scale (SRS) is a brief 4-item instrument designed to measure the alliance between therapist and client (Duncan et al., 2003). SRS forms are completed by the client at the beginning of each session attended at the CAC. Each of the four items measures a specific characteristic of the therapeutic alliance: (1) the bond between the therapist and the client, (2) the agreement of therapy goals, (3) the agreement of tasks in therapy, and (4) the client's perception of whether or not the therapy and therapist are helpful. Individual item measurement is based on a 10-cm visual analog; a measurement scale that records responses as they occur along a continuum. For this measure, clients are asked to mark a line on the continuum in response between two prompts: "There was something missing in the session today" to "Overall, today's session was right for me." A composite score is calculated by summing the measurements of each item to the nearest centimeter, with a total possible score of 40. Thus, high scores indicate high alliance, while low scores suggest negative perceptions of the therapist and/or therapy. Alpha coefficients for the SRS was .88 with a test-retest reliability estimate of .64.

Psychotherapy Outcomes. The Youth Outcome Questionnaire 30.2 (YOQ) is a computer-based 30 item parent/guardian/self-report instrument that measures child and adolescent progress throughout treatment; it is administered before every session attended at the CAC (Burlingame, Lambert, Hoag, & Hope, 1996). The measure assesses emotional and

behavioral change in six subdomains (somatic complaints, social isolation, aggression, conflict, hyperactivity, and depression), producing scores for each subscale along with a total score. The YOQ-30.2 is available for children and adolescents ages 4-18, but adolescents can complete it as a self-report measure between the ages of 12-18. Evaluators are asked to rate questions based on how true each statement is in the past 7 days; items reflect statements such as "I argue or speak rudely to others" or "I am tense and easily startled (jumpy)". Items are formatted as Likert-type scales ranging from 0 (almost never or never) to 4 (almost always or always) and can have a maximum possible score of 120. Low scores indicate low symptomology and high scores reflect the inverse. The YOQ has high internal consistency with an estimate of .94 across four samples (e.g, school, community, clinical outpatient, and clinical inpatient). Test-retest reliability was estimated to be between .56 and .82.

Time. Therapy may be short- or long-term depending upon client need and progress. Chronological time was measured as the time that elapsed between each therapy session. Hierarchical linear modeling of longitudinal data requires ordering time variables around a single reference occasion. In the current study, the first session represented the reference occasion, and was coded as Time 0. All subsequent sessions were numbered sequentially. For example, Time 0, 1, and 2 in the dataset represented sessions 1, 2, and 3, respectively.

Statistical Analyses

A hierarchical linear model (HLM) analysis was conducted to investigate the impact of individual strengths on the relationship between therapeutic alliance and therapy outcomes across the course of treatment. There is a paucity of research examining the relationship between therapeutic alliance and therapy outcomes in both children and adolescents; furthermore, even less have studied the causal roles of these variables with longitudinal data. HLM is the most

efficient method for answering the proposed research questions, especially when considering longitudinal datasets. Firstly, HLM can account for missing data. Other analyses, like multiple regression and structural equation modeling (SEM), must delete incomplete data, which lessens sample size and power (Rubin, Witkiewitz, Andre & Reilly, 2007; Huta, 2014). Conversely, HLM can simply work with the data it is given whereas SEM must utilize multiple imputation (Huta, 2014). Secondly, the nested structure of HLM allows for step-wise analysis of both within- and between-subjects effects as proposed in the original research questions. Because multiple regression and SEM utilize a simultaneous approach to analyzing the data, it is hard to parse out inter-/intra-effects that are typically the focal point of longitudinal studies (Hox & Stoel, 2005).

One caveat in utilizing HLM is the determination of sufficient sample size. For other statistical methods, power analyses are often used to estimate these parameters. In multilevel modeling, however, power analyses are often not possible with these more complicated research designs due to a) different sample sizes at different levels, and b) different randomization at each level (Hox, Moerbeek & van de Schoot, 2017). For these reasons, studies employing multilevel models often rely on prior statistical simulation studies; this research specifically looks at the magnitude of change in effects based on differing sample sizes across thousands of simulated cases. Results from Maas and Hox's (2005) simulation indicated that level two sample sizes exceeding 50 (groups) with smaller intraclass correlations approach a 5% level of significance and are suitable for analysis and interpretation (Maas & Hox, 2005). Thus, the current level two sample size of 58 is sufficient for the purposes of this study.

Statistical Model. To reiterate, the current study poses three research questions: (1) do self-reported strengths significantly impact initial alliance and/or the rate of change in

therapeutic alliance in treatment, (2) does the trend in therapeutic alliance affect the trend in therapy outcomes over the course of treatment, and (3) do those same strengths, on average, moderate the overarching relationship between the trend in therapeutic alliance and the trend in psychotherapy outcomes? Controlling for age and symptom type (e.g., internalizing vs. externalizing), it is hypothesized that: (1) self-reported strengths will significantly impact initial and/or the trend in therapeutic alliance, (2) higher ratings of therapeutic alliance will correlate with more positive therapy outcomes throughout the course of treatment, and (3) self-reported strengths will moderate the overarching relationship between the trend in therapeutic alliance and the trend in psychotherapy outcomes. The proposed model is illustrated in Figure 1.

Due to the complexity of the full model, the analysis was divided into three separate steps. First, the effects of adolescent strengths on the initial status of alliance and the rate of change in alliance over time was analyzed, controlling for age, internalizing, and externalizing symptoms. The levels denote the hierarchical structure of the model. In HLM, repeated measures are nested within individuals so that Level-1 represents the repeated measures occurring over time, and level-2 represents each individual client. This first step is represented by the following equation:

Level-1: $\text{Alliance}_{ti} = \pi_{0i} + \pi_{1i}\text{Time}_{ti} + e_{ti}$

Level-2: $\pi_{0i} = ß_{00} + ß_{01}\text{Strengths}_i + ß_{02}\text{Age}_i + ß_{03}\text{Internalization}_i + ß_{04}\text{Externalization}_i + U_{0i}$

$\pi_{1i} = ß_{10} + ß_{11}\text{Strengths}_i + ß_{12}\text{Age}_i + ß_{13}\text{Internalization}_i + ß_{14}\text{Externalization}_i + U_{1i}$

Parameters:

Covariance:

$$\mathbf{G}_i = V\begin{pmatrix} U_{0i} \\ U_{1i} \end{pmatrix} = \begin{pmatrix} \tau_{00} & \\ \tau_{10} & \tau_{11} \end{pmatrix} \qquad \mathbf{R}_i = V(e_i) = \begin{pmatrix} \sigma_1^2 & 0 & .. & 0 \\ 0 & \sigma_2^2 & .. & 0 \\ : & : & & : \\ 0 & 0 & .. & \sigma_T^2 \end{pmatrix}$$

t = measurement occasions

i = individuals
$Time_{ti}$ = the time elapsed between the *t*-th occasion and the reference occasion
$Alliance_{ti}$ = Therapeutic Alliance
π_{0i} = Alliance Intercept (initial)
π_{1i} = Alliance Slope (rate of change)
e_{ti} = Random error specific to each individual, i
β_{00} = Mean estimated initial status of therapeutic alliance adjusting for covariates
β_{10} = Mean estimated rate of change in therapeutic alliance adjusting for covariates
β_{01} = Effect of pre-treatment adolescent strengths on initial alliance
β_{02} = Effect of age at treatment onset on initial alliance
β_{03} = Effect of pre-treatment internalizing problems on initial alliance
β_{04} = Effect of pre-treatment externalizing problems on initial alliance
β_{11} = Effect of pre-treatment adolescent strengths on rate of change in alliance
β_{12} = Effect of age at treatment onset on rate of change in alliance
β_{13} = Effect of pre-treatment internalizing problems on rate of change in therapeutic alliance
β_{14} = Effect of pre-treatment externalizing problems on rate of change in therapeutic alliance
U_{0i} = Random effects of Alliance intercept (initial)
U_{1i} = Random effects of Alliance slope (rate of change)

The estimates of each random effect from this equation, represented as the impact of strengths on initial alliance (random intercept, denoted as U_{0i}) and the rate of change in alliance over time (random slope, denoted as U_{1i}), were then saved for each participant to estimate the subsequent relationship between those random effects and the rate of change in overall therapeutic outcomes. The second step is, thus, represented by the following equation:

Level-1: $Outcome_{ti} = \pi_{0i} + \pi_{1i} Time_{ti} + e_{ti}$

Level-2: $\pi_{0i} = ß_{00} + ß_{01}InitialAlliance + ß_{02}ROCAlliance + U_{0i}$

$\pi_{1i} = ß_{10} + ß_{11}InitialAlliance + ß_{12}ROCAlliance + U_{1i}$

Parameters:

Covariance:

$$\mathbf{G}_i = V \begin{pmatrix} U_{0i} \\ U_{1i} \end{pmatrix} = \begin{pmatrix} \tau_{00} & \\ \tau_{10} & \tau_{11} \end{pmatrix} \qquad \mathbf{R}_i = V(e_i) = \begin{pmatrix} \sigma_1^2 & 0 & .. & 0 \\ 0 & \sigma_2^2 & .. & 0 \\ : & : & & : \\ 0 & 0 & .. & \sigma_T^2 \end{pmatrix}$$

$Outcome_{ti}$ = Therapeutic Outcomes

β_{00} = Mean estimated initial status of Outcomes
β_{10} = Mean estimated rate of change in Outcomes
ß$_{01}$InitialAlliance = Random effects
ß$_{02}$ROCAlliance = Random effects
ß$_{11}$InitialAlliance = Random effects of initial alliance on the trend in outcomes
ß$_{12}$ROCAlliance = Random effects of trend in alliance on the trend in outcomes
U_{0i} = Random effects of Outcomes intercept
U_{1i} = Random effects of Outcomes slope

Finally, individual strengths were added into a third multilevel model to determine whether those strengths moderate the relationship between the trend in alliance on the trend in outcomes. The third step is represented by the following equation:

Level-1: $Outcome_{ti} = \pi_{0i} + \pi_{1i}Time_{ti} + e_{ti}$

Level-2: π_{0i} = ß$_{00}$ + ß$_{01}$InitialAlliance + ß$_{02}$ROCAlliance + ß$_{03}$Strengths + ß$_{04}$Strengths*ROCAlliance+ U_{0i}

π_{1i}= ß$_{10}$ + ß$_{11}$InitialAlliance + ß$_{12}$ROCAlliance + ß$_{13}$Strengths + ß$_{14}$Strengths*ROCAlliance + U_{1i}

Parameters:

Covariance:

$$\mathbf{G}_i = V\begin{pmatrix} U_{0i} \\ U_{1i} \end{pmatrix} = \begin{pmatrix} \tau_{00} & \\ \tau_{10} & \tau_{11} \end{pmatrix} \qquad \mathbf{R}_i = V(e_i) = \begin{pmatrix} \sigma_1^2 & 0 & .. & 0 \\ 0 & \sigma_2^2 & .. & 0 \\ : & : & & : \\ 0 & 0 & .. & \sigma_T^2 \end{pmatrix}$$

$Outcome_{ti}$ = Therapeutic Outcomes
β_{00} = Mean estimated initial status of Outcomes
β_{10} = Mean estimated rate of change in Outcomes
ß$_{01}$InitialAlliance = Effect of initial alliance on initial outcomes
ß$_{02}$ROCAlliance = Effect of rate of change in alliance on initial outcomes
ß$_{03}$Strengths = Effect of strengths on relationship between initial alliance and initial outcomes
ß$_{03}$Strengths = Moderating effect of strengths on relationship between initial alliance and initial outcomes
ß$_{11}$InitialAlliance = Effect of initial alliance on the trend in outcomes
ß$_{12}$ROCAlliance = Effect of trend in alliance on the trend in outcomes
ß$_{13}$Strengths = Effect of strengths on relationship between trend in alliance and trend in outcomes

$ß_{14}$Strengths = Moderating effect of strengths on relationship between trend in alliance and trend in outcomes
U_{0i} = Random effects of Outcomes intercept
U_{1i} = Random effects of Outcomes slope

Statistical Software. Statistical analyses were completed through STATA (StataCorp, 2019). For the current study, missing data on any measure were given the value of a period, denoted as ".". Given the larger sample size and points of data collected over time, a Maximum Likelihood Estimation was used to estimate parameters of both models. As mentioned before, time is measured by session number. For this analysis, time was recorded so that Session 1= Time point 0. For example, a client that attended three sessions was coded as "0", "1", "2". Alliance, age, symptom type, and strengths were standardized and converted to z-scores to ease interpretation.

Analytical Strategy. First, diagnostic assumption checks were conducted by testing the normality and skewness of the predictors. In order to account for normality of the level-1 residuals, a transformation (Cube root of (Y-Median Y)) of both dependent variables, therapeutic alliance and psychotherapy outcomes, was done. The transformation helped to center the dependent variables as well as adjust the skew of the distribution. Following the transformation, the data indicate a fairly linear normality graph with some deviance at the end of the tails, though not overly concerning (Skewness= -.007, Kurtosis= 4.93; See Figure 2). All variables in the model were then standardized to enhance interpretation of results.

Next, a theory-driven approach for model development was implemented, meaning all predictors were analyzed simultaneously rather than sequentially in the STATA program. Given the larger sample size and points of data collected over time, a Maximum Likelihood Estimation was used to estimate model parameters. A likelihood ratio (LR) test of the level 1 model was

used, and determined that the only Level-1 variable, time, should have a random slope, $\chi^2(2) = 59.66$, $p<0.0001$. An unstructured covariance matrix was used to allow variances and covariances to vary freely, a strategy that is commonly used in analyses of longitudinal data.

The first multilevel model was then analyzed. Two LR tests were conducted to determine the best fit residual structure between homogenous, heterogeneous, and autoregressive structures. The results revealed a significant difference between the homogenous and each of the two subsequent residual structures. The heterogenous error variance model fit the data significantly better than the homogeneous error variance model, $\chi^2(5) = 49.59$, $p<0.0001$. The autoregressive error variance model also fit the data significantly better than the homogeneous error variance structure, $\chi^2(1) = 34.69$, $p<0.0001$. Considering that heterogenous and autoregressive structures are non-nested, an analysis of Akaike's information criteria (AIC) and Bayesian information criteria (BIC) was then conducted to determine the best fit model between the two structures. The analysis indicated that the heterogeneous residual structure resulted in a lower AIC and BIC, suggesting an overall better fit for the model (AIC=1476.412, BIC=1563.232).

The second multilevel model utilized the random effects estimates from the first multilevel model to analyze the effects of the trend in therapeutic alliance and the trend in therapy outcomes over the span of treatment. All covariates were then added in to create a third multilevel model aimed to analyze the moderating effect of strengths on the overarching relationship between the trend in therapeutic alliance and the trend in psychotherapy outcomes when controlling for age at treatment onset and symptom type. Like the first multilevel model, an unstructured covariance matrix and a heterogenous residual structure were employed for both the second and third multilevel models.

CHAPTER IV

RESULTS

Null Model

Descriptive information of variables, as well as correlations among variables can be found in Tables 6-9. The null model analyzed the fixed effects estimate of the intercept without predictors (See Table 7; $\beta = 36.36$, s.e. = 0.45, $p < 0.05$). The null model's intra-class correlation was .44, suggesting that individuals account for 44% of variance in alliance scores.

Multilevel Modeling

In total, three separate multilevel models were run to provide different information about the trends in the data (See Table 10). The first multilevel model simultaneously analyzed the effects of all predictors and interactions on initial alliance and the trend in therapeutic alliance over time. The results indicated that the sole level 1 predictor, time, continued to be a significant predictor of the trend in therapeutic alliance; average therapeutic alliance increased by 0.05 (s.e. = 0.02, $p<0.05$) per session, regardless of the inclusion of other predictors. Analysis of level 2 predictors indicated that internalizing and externalizing symptomatology significantly impacted average therapeutic alliance at the onset of treatment. On average, initial therapeutic alliance decreased by 0.24 (s.e. = 0.11, $p<0.05$) for every unit increase in internalizing symptom type. Initial therapeutic alliance also decreased by 0.22 (s.e. = 0.11, $p<0.05$) for every unit increase in externalizing symptom type. Age at treatment onset and self-reported adolescent strengths were not statistically significant predictors of initial alliance. The analysis also revealed that there were no significant interactions, suggesting that all of the predictors included in the present study did not significantly impact the trend in therapeutic alliance over the span of treatment. The unexplained variance in the random intercept was 0.001(s.e. = 0.006), and the unexplained

variance in the random slope was 0.42(s.e. = 0.09). The covariance between the random intercept and the random slope was -0.002(s.e. = 0.005).

The second multilevel model utilized estimates of the random effects of strengths on the trend in therapeutic alliance, when controlling for other level 2 predictors, to analyze each factors' overarching impact on the trend in therapy outcomes across the span of treatment. Thus, the random effect estimates (e.g., random intercept and random slope) of each participant in the first multilevel model were saved and utilized as predictors in the second multilevel analysis. The random intercept estimate represented the initial alliance adjusting for predictors, and the random slope estimates represented the rate of change in alliance over the length of treatment when accounting for those same predictors. Of interest to the current study was how the effects of strengths on the trend in alliance impacted the trend in therapy outcomes. The results indicated that time was also a significant predictor of the trend in psychotherapy outcomes, suggesting that overall symptoms decreased by 0.05 (s.e. = 0.008, $p<0.05$) per session. However, there was no statistical significance in neither the effects of initial alliance on initial outcomes nor the trend in alliance on the trend in outcomes. The unexplained variance in the random intercept was 0.002(s.e. = 0.0007), and the unexplained variance in the random slope was 0.59(s.e. = 0.12). The covariance between the random intercept and the random slope was 0.003(0.006). As for predictability, age, externalizing problems, and strengths explained 17% of the variance of the individual random intercept, and time explained 14% of the within individual variance of alliance.

For the third and final model, all predictors were reintroduced into the second multilevel analyses. Time continued to be a significant predictor for therapy outcomes ($\beta = -0.05$, s.e. = 0.008, $p < 0.001$). While neither initial alliance nor the trend in alliance significantly impacted

initial outcomes or the trend in outcomes, there were some interesting findings regarding the relationship between covariates and overall outcomes. The results indicated that externalizing symptom type significantly affected the trend in overall outcomes, such that the trend in outcomes decreased by 0.02 (s.e. = 0.009, $p<0.05$) for every unit increase in externalizing symptom type. Additionally, adolescent strengths was a significant predictor on initial outcomes; average initial therapy outcomes increased by 0.31 (s.e. = 0.09, $p<0.05$) for every unit increase in self-reported strengths. No other covariates evidenced statistical significance. The unexplained variance in the random intercept was 0.002(s.e. = 0.0007), and the unexplained variance in the random slope was 0.59(s.e. = 0.12). The covariance between the random intercept and the random slope was 0.003(s.e. =0.006). As for predictability, age, externalizing problems, and strengths explained 24% of the variance of the individual random intercept. Within individual variance of outcomes was calculated using residual variances by each age; time explained 49-87% of the within individual variance of outcomes.

Post Hoc Analyses

While there were some statistically significant results that were consistent with previous research, it became apparent that there were confounding factors impacting the current findings. Specifically, the range of total treatment sessions of CAC participants did not align with the typical range of treatment sessions needed to evidence clinically meaningful change. Of particular interest to this topic is the study of the dose-response relationship of psychotherapy in which the dose is the treatment duration and the response is treatment outcome (Hansen, Lambert & Forman, 2002). The current literature suggests that clients of all ages need, on average, roughly 20 sessions for at least 50% of the sample to see improvements in treatment outcomes (Hansen, Lambert & Forman, 2002; Harnett, O'Donovan & Lambert, 2010). Given

this information, it was determined that additional analyses would provide invaluable insight about whether treatment length affected findings (See Table 11). For these post hoc analyses, all participants that exceeded 20 sessions were considered outliers in the data and were, thus, excluded. It is important to note here that the number of individuals and observations were greatly reduced by this post hoc exclusionary criteria. For this reason, the current findings should be interpreted with caution, as it is likely the much smaller sample size impacted the power of this study.

In total, fourteen participants were ultimately excluded for the post hoc analyses. The exact same analytical strategy was employed for the follow-up analysis. First, the analysis looked at the effects of predictors on therapeutic alliance. As with previous findings, time continued to be a significant predictor for alliance ($\beta = 0.06$, s.e. = 0.02, $p < 0.001$). The results also indicated that externalizing symptom type continued to be statistically significant, such that average therapeutic alliance at the onset of treatment decreased by 0.24 (s.e. 0.12, $p < 0.05$) for every unit increase in externalizing symptoms. No other statistically significant effects were reported. Again, the random effects estimates of the first model were saved and utilized for the second model. This model analyzed the effects of initial average alliance and the trend in alliance over time on overall psychotherapy outcomes, and did not include any predictors. Time continued to be a significant predictor of overall outcomes ($\beta = -0.06$, s.e. = 0.01, $p < 0.001$), meaning that, on average, outcomes improved with each session. However, the results did not reveal any other significant relationship between alliance and therapy outcomes, despite the exclusion of participants with greater than 20 sessions. Finally, all predictors (e.g., age at onset, symptom type, strengths) were reintroduced to the second model to better understand if those particular factors moderate the relationship between therapeutic alliance and outcomes. Again,

there were no statistically significant relationships between alliance and outcomes. However, when considering all moderating factors, the results indicate that both externalizing symptoms and strengths significantly impacted initial average psychotherapy outcomes. This suggests that for adolescents in which initial pathology was considered high, they typically had greater externalizing symptoms ($\beta = 0.20$, s.e. = 0.10, $p < 0.05$) and strengths ($\beta = 0.24$, s.e. = 0.09, $p < 0.05$). When analyzing the rate of change in treatment outcomes over time, the results also indicated that both age at treatment onset and externalizing symptom type significantly predict the trend in outcomes. Specifically, overall outcomes decreased by 0.03 (s.e. = 0.01, $p <0.05$) with every unit increase in age at onset, meaning that children who were older experienced better outcomes over the span of treatment. Consistent with the initial analysis, externalizing symptom type statistically significantly impacted the trend in psychotherapy outcomes; reported outcomes were more likely to improve with every unit increase in externalizing symptoms ($\beta = -0.03$, s.e. = 0.01, $p < 0.05$)

CHAPTER V

CONCLUSIONS

The purpose of the present study was to investigate the effects of self-reported adolescent strengths on initial therapeutic alliance and the trend in therapeutic alliance over the span of treatment. Ultimately, the study sought to understand the overarching relationship between the rate of change in alliance on the trend in therapy outcomes when considering and controlling for pre-treatment characteristics such as age at treatment onset, symptom type, and self-reported strengths. It was hypothesized that: (1) self-reported strengths will significantly impact the quality of the therapeutic alliance, (2) the rate of change in therapeutic alliance will be associated with a more positive trend in therapy outcomes across treatment, and (3) self-reported strengths will moderate the relationship between therapeutic alliance and psychotherapy outcomes. Based on previous literature, age and symptom type (e.g., externalizing vs. internalizing) are identified covariates, and were controlled for.

Whereas there has been significant growth in the promotion of strength-based approaches to assessment and therapy over the past two decades, little is known about the effect of self-reported adolescent strengths on therapeutic alliance and overall outcomes. Previous research suggests that pre-treatment characteristics such as age and symptom type can impact alliance. However, there are no studies that have examined the effects of strengths on these therapeutic processes (Bickman et al., 2004; Shirk & Karver, 2003). Unfortunately, strength-based research often employs inconsistent definitions of psychological strengths, which has hindered the study of the relationship between strengths and therapy outcomes. Furthermore, studies of therapeutic alliance and outcomes typically utilize a pre-post treatment design, which does not accurately capture the dynamic nature of alliance; the effects of individual ruptures and repairs in alliance

on overall outcomes is widely understudied and warrants additional study. Moreover, current evidence-based practices in clinical outcomes studies support the use of patient-centered approach to data analysis, collecting continuous patient progress data and studying trends in the data over the span of treatment, as opposed to pre-post treatment designs. The literature suggests that this type of data collection provides a unique, individualized picture of how clients respond to a given intervention, and can provide valuable feedback for practitioners after each session during treatment (Howard, Moras, Brill, Martinovich, & Lutz, 1996; Lambert, Hansen & Finch, 2001).

Most importantly, the current study contributes to existing research by examining the intersection of strength-based and clinical psychology; an area of psychological practice that has been relatively ignored by the scientific community despite the many advances in patient-centered research. The findings support previous research regarding the effects of certain pre-treatment characteristics on alliance but did not evidence any associations between predictors and the trend in alliance or outcomes across the span of treatment.

Time and Therapeutic Alliance

The current literature regarding therapeutic alliance acknowledges that alliance between client and therapist is rarely linear, rather there are ruptures and repairs that occur throughout the clinical relationship that potentially lend to success in therapy (Kivlighan & Shaughnessy, 2000). Based on this information, it seems more appropriate to take a patient-centered approach to this body of research by analyzing trends in the data as opposed to looking at a single time point. Unfortunately, researchers continue to utilize a pre-post treatment design to study alliance, which systematically fails to capture the dynamic nature of alliance. Through longitudinal multilevel modeling techniques, the present study advanced our understanding of alliance and evidenced

statistically significant findings to suggest that time effects therapeutic alliance. Even when considering the fluctuation that occurs in alliance from session to session, client-reported therapeutic alliance increased with every session in treatment, suggesting that clients perceived improvements in the therapeutic relationship throughout the course of therapy. Taken at face value, these results do not add to our general understanding to the function of alliance in therapy. However, such findings do support the use of patient-centered analytic strategies in clinical outcomes research. Specifically, understanding the overarching trend in each client's self-reported outcomes allows for an individualized data-driven approach to employing and enhancing the therapeutic alliance. The findings from the current study continue to support the need for patient-centered research regarding clinical therapy outcomes and therapeutic alliance.

Pre-Treatment Characteristics and Alliance

Consistent with previous research, the current study found that pre-treatment characteristics such as a symptom type were statistically significant predictors of therapeutic alliance at the onset of treatment. Both internalizing and externalizing symptomatology negatively impacted initial therapeutic alliance, meaning as parent-reported pathology levels increased, the child or adolescent's initial interaction with the clinician decreased. The broader implications of these findings highlight the importance of rapport building with clinically high-risk populations. Children and adolescents with higher self- and/or parent-reported pathology may require additional time in therapy dedicated to rapport-building, so that they can more easily access therapeutic benefits of alliance and treatment. While these results may seem intuitive to the well-trained clinician, it is important to highlight the utility of data-driven approaches to therapy; longitudinal modeling can allow researchers to simultaneously analyze several

predictors on alliance when considering the often non-linear trend in therapeutic alliance for each individual client.

Other pre-treatment characteristics such as age at treatment onset and self-reported strengths were not statistically significant predictors of initial alliance. Prior research indicated that age significantly impacted therapeutic alliance in children and adolescents (Bickman et al., 2004); it is possible that when controlling for other pre-treatment characteristics such as symptom type and individual strengths those predictors may have interfered with the hypothesized relationship between age and alliance. As for the lack of findings for individual strengths, it is important to note that this study is the first of its kind. The current literature base is sorely lacking in studying the effects of strength on therapeutic processes. While the current findings cannot comment on the relationship between strengths and alliance, it is a step in the right direction, and supports the need for further analysis of the many different types of strengths identified in the literature.

Examining the effects of predictors on initial alliance was an important aspect of the current analysis, but this study ultimately sought to understand how those factors affected the trend in the therapeutic alliance over time. Unfortunately, there were no statistically significant interaction effects between age, symptom type, or strengths and alliance, meaning these characteristics did not predict changes in alliance over time. As previously mentioned, there have been very few studies that examine the nature of alliance utilizing longitudinal analyses; further, even less have studied the effects of strengths on alliance with these modelling techniques. Despite the lack of prior research, the results may suggest several clinical and/or statistical implications. First, the inclusion of several control variables was related only to previous literature on therapeutic alliance, but none of those prior studies focused specifically on

strengths. It is possible that the way in which the current study was modeled may have been too restrictive for preliminary research on strengths-based, clinical outcomes. Second, it is possible that the measures used in the current analysis were not appropriate for estimating pre-treatment characteristics or the study sample was not sufficient for the current analysis. Such limitations will be described further in later sections. Lastly, it equally likely that there is simply no connection between these factors and alliance over the span of treatment; however, it is important to remember that the current study did find that alliance was significantly impacted by time. Previous literature has identified models of therapeutic alliance that point towards different characteristics that impact how alliance unfolds over treatment (Karver, Handelsman, Fields, & Bickman, 2005). For these reasons, further study is still warranted to examine how individual pre-treatment client and/or therapist characteristics influence the relationship between time in session and therapeutic alliance.

Trends in Alliance and Outcomes

The second step in the formal analyses sought to understand how the trend in therapeutic alliance impacted the rate of change in therapy outcomes over the span of treatment. The results indicated that there was no significant relationship between therapeutic alliance and psychotherapy outcomes, which is inconsistent with previous literature. It is likely that these results were impacted by confounding variables that could not be controlled for in the current study. For example, adolescent clients are asked to complete the measure therapeutic alliance (i.e., Session Rating Scale) in front of the student clinicians. While the BASC measure provided an index to account for socially desirable responding, it is clear that this could still be an issue with the Session Rating Scale, which does not include a means to ensure socially desirable responding does not occur. Additionally, this particular study is at the forefront of using

hierarchical linear modelling to analyze the relationship between alliance and outcomes longitudinally. Despite non-significant results, the findings clearly show that time is a statistically significant predictor for both alliance and outcomes separately, which supports the continued utility of longitudinal analyses for studying such variables in the future.

Alliance, Outcomes, and Predictors

The final analysis attempted to look at the moderating effect of predictors on the relationship between alliance and outcomes. Again, the relationship between alliance and outcomes was not statistically significant, but the results did reveal several important findings about the relationship between specific predictors and psychotherapy outcomes. Externalizing symptoms affect overall outcomes, such that higher parent-reported externalizing symptoms at treatment onset was associated more so with gradual improvements in outcomes over the span of treatment, while internalizing symptoms did not have any effects. These results were consistent with the previously literature and further support the importance of studying the impact of pre-treatment characteristics on clinical outcomes through longitudinal analyses. Most importantly, though, there was evidence to support self-reported adolescent strengths as a predictor of initial average therapy outcomes, but the effect was in the opposite direction hypothesized by the current study. The results indicated that adolescents who self-identified more strengths had worse overall outcomes reported at the beginning of treatment. These findings potentially shed light on a broader conversation about help-seeking behaviors in youth and access to adequate mental healthcare. One explanation for this effect could be that adolescents and families with strong support systems, emotional awareness, and the communication skills necessary to voice concerns and needs may be much more likely to engage in help-seeking behaviors to address life stressors. Previous research on help-seeking behaviors in adolescents indicate that many

psychosocial factors, such as social support, self-reliance, and emotional competence influence these processes (Saunders, Resnick, Hoberman & Blum, 1994; Rickwood, Deane, Wilson & Ciarrochi, 2005). This particular finding still begs the question, then, of how can practitioners utilize those pre-identified strengths or help-seeking behaviors to further support overall alliance and better therapy outcomes throughout treatment? Further study may be beneficial to compare help-seeking behaviors and strength-based literature, and how their impact can potentially affected clinical practice in adolescent populations over the span of treatment.

Post Hoc Analysis

The range of total treatment sessions was between 3 and 68 with an average of 16 sessions; previous literature suggests that the average amount of treatment sessions needed to observe at least 50% improvement is roughly 20 sessions (Hansen, Lambert & Forman, 2002; Harnett, O'Donovan & Lambert, 2010). Because there were many participants that attended over 20 sessions, it was determined that additional analyses may be beneficial to better understand how the identified predictors impact alliance and outcomes in those cases which more closely mimic the total number of sessions attended in real-world clinical practice.

Despite accounting for total sessions attended, the trend in alliance did not significantly impact the trend in outcomes; However, there were some small differences noted when looking at the effects of predictors on therapeutic outcomes alone. Specifically, the results indicated, for participants that attended 20 sessions or less, externalizing problems was a statistically significant predictor of both initial outcomes and the trend in outcomes over time. Additionally, age at onset also predicted the trend in outcomes through the course of treatment. Older adolescents experienced improvements in symptoms when they attended between 3 and 20

sessions. Finally, strengths continued to inversely impact outcomes, such that adolescents that reported higher strengths typically also had higher reported symptoms at the onset of treatment.

Study Limitations and Future Research Directions

This study added to the current literature regarding our understanding of analyzing trends in clinical outcomes research, there were several limitations that potentially affected the analyses and findings. A major limitation involves the measurement of strengths in the present study. The composites in the BASC measure individual strengths that are typically identified in the strengths-based literature (Garmezy, 1985; Masten, 2001; Peterson & Seligman, 2004; Werner & Smith, 1982; Wyman et al., 1999); however, the adaptive scales composite of the BASC that were utilized as a measure of strengths for the purposes of this study are not considered true measures of strengths as the developers do not make any direct references to specific strength-based models (Reynolds & Kamphaus, 2015; Reynolds & Kamphaus, 2007). Future studies that attempt to analyze the relationship between individual adolescent strengths and therapeutic alliance or outcomes would benefit from using a true strength-based measure that is well-established; one that is valid and reliable in measuring strengths found within a model of strengths. Other methodological concerns regarding measurement include the administration of the session rating scale (i.e., measure of therapeutic alliance). The SRS is given to clients at the end of each session with most therapists sitting or standing directly next to the client. It is possible that impressionable child and adolescent clients may feel pressured to answer in a desirable manner, indicating possible issues with social desirability.

Other limitations involve the setting where services were provided. The data was collected through a training facility for doctoral-level student counselors. Previous research has shown a correlation between amount of therapist experience, clinical outcomes, and overall

client satisfaction (Stein & Lambert, 1995). More experienced clinicians may impact both alliance and other therapeutic processes in ways that were not identified in the current study. Further, the current study was unable to account for changes in therapists across treatment. For example, many student clinicians only see clients for roughly two academic semesters. It is possible that a shift in clinicians may have led to an inaccurate depiction of alliance for any given therapist. As previously mentioned, there were many participants who attended more than 20 sessions, which is the average number of sessions needed to see clinical improvement (Hansen, Lambert & Forman, 2002; Harnett, O'Donovan & Lambert, 2010). The post hoc analyses revealed some new information, indicating that outliers in the sample (e.g., participants who attended greater than 20 sessions) potentially affected the results. The effects of these limitations are two-fold. The longer a participant stays in treatment, the more likely they were to see multiple clinicians while seeking treatment at the CAC. Future studies should look at both therapist effects as well as length of treatment when analyzing the relationship between alliance and therapy outcomes.

Finally, the size and sample of the data were also limitations of the current study. A majority of participants were Caucasian and fell within younger age ranges (12-14). This skew in demographics ultimately impacts the generalizability of the study. Given these limitations, future studies should study trends in alliance and outcome data when therapy services are provided by more experienced clinicians as well as with a more diverse population that may potentially report differing levels of strengths and other pre-treatment characteristics. Additionally, while the sample size for the current study was adequate to detect moderate effects, it is still relatively small for HLM. Future research using a larger sample size would allow for a higher quality

investigation of both between and within client characteristics and their relationship to therapeutic processes.

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APPENDIX A

FIGURES

Figure 1. Hypothesized Model of Adolescent Strengths on Therapeutic Processes

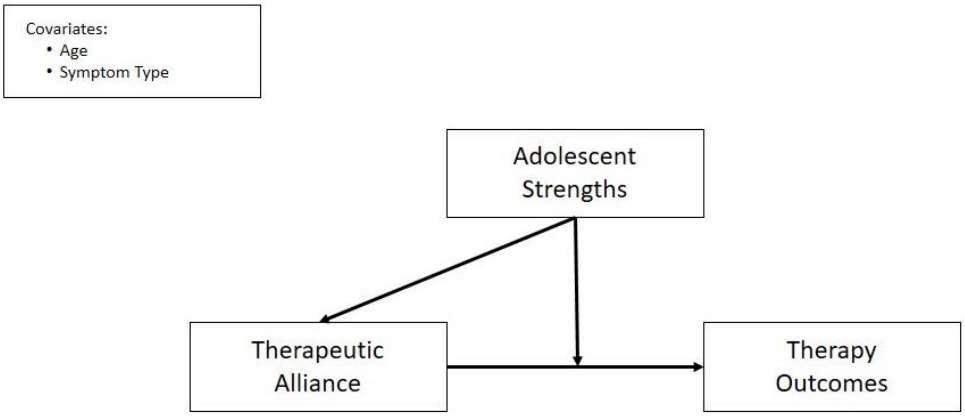
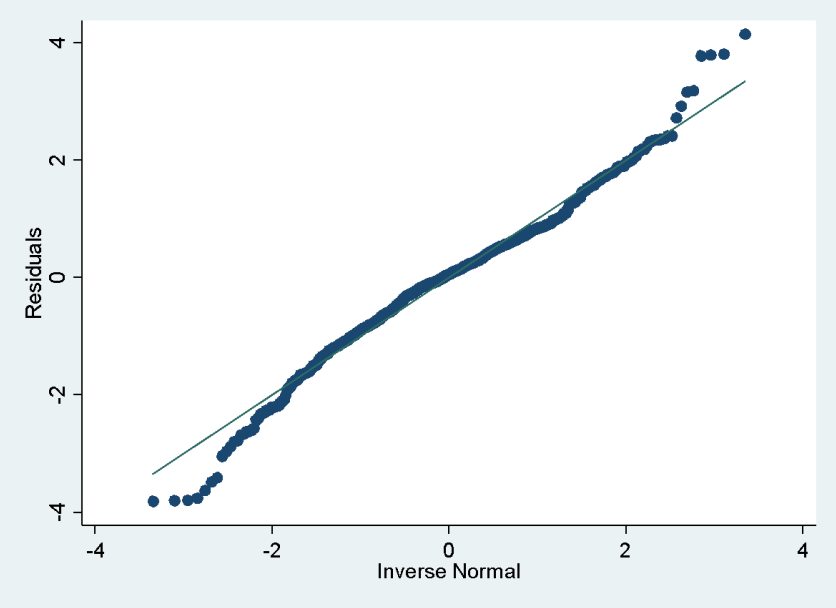


Figure 2. Normality Distribution Following Y Transformation.



APPENDIX B

TABLES

Table 1.

Participant Demographics

Demographic Factor	n_j	%
Gender		
Male	25	43.10
Female	33	56.90
Race/Ethnicity		
White	30	51.72
Hispanic	18	31.03
Black	5	8.62
Biracial/Multiracial	5	8.62
Age		
12	15	25.86
13	9	15.52
14	11	18.97
15	11	18.97
16	6	10.34
17	6	10.34

Note. $N_i = 58$; $n_j = 871$.

Table 2.

Total Number of Sessions

Number of Sessions	N	%
3 Sessions	6	10.34
4 Sessions	1	1.72
5 Sessions	3	5.17
7 Sessions	7	12.07
8 Sessions	2	3.45
10 Sessions	3	5.17
11 Sessions	3	5.17
12 Sessions	2	3.45
14 Sessions	2	3.45
15 Sessions	5	8.62
16 Sessions	2	3.45
17 Sessions	3	5.17
18 Sessions	3	5.17
19 Sessions	2	3.45
23 Sessions	2	3.45
24 Sessions	2	3.45
27 Sessions	3	5.17
28 Sessions	1	1.72
29 Sessions	1	1.72
32 Sessions	1	1.72
33 Sessions	1	1.72
43 Sessions	1	1.72
46 Sessions	1	1.72
68 Sessions	1	1.72

Table 3.

BASC-2 and -3 Correlations between PRS-A and SRP-A Adaptive Scales (Combined General and Clinical Samples)

	SRP-A				
PRS-A	Personal Adjustment	Relations with Parents	Interpersonal Relations	Self-Esteem	Self-Reliance
BASC-2					
Adaptive Skills	.38	.33	.27	.17	.39
Adaptability	.32	.29	.22	.16	.31
Social Skills	.30	.30	.20	.10	.32
Leadership	.36	.25	.28	.18	.40
Activities of Daily Living	.31	.30	.20	.14	.30
Functional Communication	.33	.26	.24	.15	.36
BASC-3					
Adaptive Skills	.43	.34	.33	.23	.42
Adaptability	.39	.32	.33	.25	.32
Social Skills	.35	.32	.27	.17	.32
Leadership	.41	.29	.33	.22	.43
Activities of Daily Living	.36	.31	.27	.21	.35
Functional Communication	.34	.25	.26	.18	.39

Table 4.

BASC-3 SRP-A Correlations with the BASC-2.

	BASC-2
BASC-3 Composites	
School Problems	.95
Internalizing Problems	.97
Emotional Symptoms	.97
Personal Adjustment	.96
BASC-3 Subscales	
Attitude to School	.98
Attitude to Teachers	.92
Sensation Seeking	.97
Atypicality	.96
Locus of Control	.97
Social Stress	.99
Anxiety	.97
Depression	.93
Sense of Inadequacy	.95
Somatization	.84
Attention Problems	.92
Hyperactivity	.99
BASC-3 Adaptive Scales	
Relations with Parents	.98
Interpersonal Relations	.93
Self-Esteem	.93
Self-Reliance	.94

Table 5.

SRP: T-Score Mean Differences Between the BASC-3 and BASC-2.

	Adolescent Age Ranges	
	12-14	15-18
Composite		
School Problems	4	3
Internalizing Problems	3	1
Inattention/Hyperactivity	1	-1
Emotional Symptoms	4	1
Personal Adjustment	-4	-2
Clinical scale		
Attitude to School	3	2
Attitude to Teachers	4	3
Sensation Seeking	3	2
Atypicality	2	1
Locus of Control	3	1
Social Stress	3	2
Anxiety	1	-1
Depression	4	2
Sense of Inadequacy	1	-1
Somatization	3	1
Attention Problems	1	0
Hyperactivity	1	-1
Adaptive scale		
Relations with Parents	-2	-1
Interpersonal Relations	-3	-1
Self-Esteem	-3	-1
Self-Reliance	-4	-2

Table 6.

Correlations among Level 1 Variables and Alliance.

$N_i = 871$ $n_j = 58$	Y Alliance	X1 Time
Y	—	
X1	0.13	—
Mean	36.36	9.66
SD	5.17	8.08

Table 7.

Correlations among Level 2 Variables and Alliance.

$N_i = 871$ $n_j = 58$	Y Alliance	X1 Age at Onset	X2 External. Symptoms	X3 Internal. Symptoms	X4 Strengths
Y	—				
X1	0.22	—			
X2	-0.16	-0.45	—		
X3	0.02	-0.004	0.07	—	
X4	0.12	-0.01	0.36	0.29	—
Mean	36.36	14.05	58.95	64.9	64.75
SD	5.17	1.67	12.67	13.78	9.53

Table 8.

Correlations among Level 1 Variables and Outcomes.

$N_i = 871$ $n_j = 58$	Y Outcomes	X1 Time
Y	—	
X1	0.05	—
Mean	35.7	9.66
SD	17.95	8.08

Table 9.

Correlations among Level 2 Variables and Outcomes.

$N_i = 871$ $n_j = 58$	Y Outcomesd	X1 Alliance	X2 Age at Onset	X3 Extern. Symptoms	X4 Internal. Symptoms	X5 Strengths
Y	—					
X1	-0.08	—				
X2	-0.06	0.22	—			
X3	0.1	-0.16	-0.45	—		
X4	0.15	0.02	-0.01	0.07	—	
X5	0.32	0.12	-0.01	0.36	0.29	—
Mean	35.7	9.66	14.05	58.95	64.9	64.75
SD	17.95	8.08	1.67	12.67	13.78	9.53

Table 10.

Parameter Estimates.

$N_i = 871$ $n_j = 58$	Null Model Coefficient (s.e.)	Multilevel Model 1 Coefficient (s.e.)	Multilevel Model 2 Coefficient (s.e.)	Multilevel Model 3 Coefficient (s.e.)
Fixed Effects				
Intercept	0.07(0.09)	-0.18(0.1)	0.07(0.1)	0.13(0.09)
Time		0.05(0.01)*	-0.06(0.01)*	-0.06(0.01)*
Age		0.09(0.1)		-0.07(0.09)
Internalizing Symptoms		-0.22(0.11)*		0.1(0.09)
Externalizing Symptoms		-0.24(0.11)*		0.18(0.1)
Strengths		0.06(0.1)		0.32(0.09)*
MM1 U_{0i}			-0.57(4.32)	-0.56(3.41)
MM1 U_{1i}			-0.13(0.18)	-0.13(0.14)
Time*Age		0.01(0.01)		-0.01(0.01)
Time*Internalizing		0.01(0.01)		0.01(0.01)
Time*Externalizing		0.02(0.01)		-0.03(0.01)*
Time*Strengths		0.003(0.01)		0.02(0.01)
Time*MM1 U_{0i}			-0.2(0.29)	-0.22(0.27)
Time*MM1 U_{1i}			-0.002(0.13)	-0.01(0.02)
Strengths*MM1 U_{1i}				0.08(0.17)
Variance Components				
σ^2_{U0}	0.41(0.09)[a]	0.42(0.1)[a]	0.59(0.12)[a]	0.35(0.07)[a]
σ^2_{U1}		0.001(0.001)[a]	0.002(0.001)[a]	0.002(0.001)[a]
σ^2_{U01}		-0.002(0.01)[a]	0.004(0.01)[a]	0.003(0.004)[a]
σ^2_e	0.53(0.03)[a]			
σ^2_e by Age				
12		0.48(0.05)[a]	0.24(0.)[a]	0.24(0.02)[a]
13		0.26(0.04)[a]	0.07(0.01)[a]	0.07(0.01)[a]
14		0.46(0.05)[a]	0.27(0.03)[a]	0.27(0.03)[a]
15		0.35(0.05)[a]	0.21(0.03)[a]	0.2(0.03)[a]
16		0.29(0.05)[a]	0.06(0.01)[a]	0.07(0.01)[a]
17		0.11(0.02)[a]	0.13(0.02)[a]	0.13(0.02)[a]
Model Fit				
AIC		1476.412		
BIC		1563.232		
Predictability				0.24
R_1^2				0.49-0.87
R_2^2				

Note. *p<0.05, [a] significance test not conducted, MM1 U_{0i} = random intercept output from multilevel model 1, MM1 U_{1i} = random slope output from multilevel model 1, σ^2_{U0} = variance of the random intercept, σ^2_{U1} = variance of the random slope of time, σ^2_{U01} = covariance between the random intercept and slope of time, σ^2_e = residual variance.

Table 11.

Post Hoc Parameter Estimates.

N_i = 417 n_j = 42	Multilevel Model 1 Coefficient (s.e.)	Multilevel Model 2 Coefficient (s.e.)	Multilevel Model 3 Coefficient (s.e.)
Fixed Effects			
Intercept	0.01(0.1)	0.16(0.11)	0.27(0.1)
Time	0.06(0.02)*	-0.07(0.01)*	-0.07(0.01)*
Age	0.13(0.1)		-0.06(0.09)
Internalizing Symptoms	-0.04(0.11)		0.12(0.1)
Externalizing Symptoms	-0.24(0.12)		0.2(0.1)*
Strengths	0.04(0.1)		0.24(0.09)*
MM1 U_{0i}		0.03(2.47)	-0.16(1.99)
MM1 U_{1i}		0.24(0.24)	0.26(0.19)
Time*Age	0.01(0.02)		-0.03(0.02)*
Time*Internalizing	-0.01(0.02)		0.01(0.01)
Time*Externalizing	0.01(0.02)		-0.03(0.01)*
Time*Strengths	0.01(0.01)		0.02(0.01)
Time*MM1 U_{0i}		-0.06(0.26)	-0.1(0.23)
Time*MM1 U_{1i}		-0.05(0.03)	-0.03(0.02)
Variance Components			
σ^2_{U0}	0.32(0.1)[a]	0.46(0.12)[a]	0.28(0.07)[a]
σ^2_{U1}	0.005(0.002)[a]	0.004(0.002)[a]	0.003(0.001)[a]
σ^2_{U01}	-0.01(0.01)[a]	-0.005(0.01)[a]	-0.004(0.01)[a]
σ^2_e			
σ^2_e by Age			
12	0.52(0.08)[a]	0.22(0.3)[a]	0.22(0.03)[a]
13	0.18(0.04)[a]	0.09(0.02)[a]	0.09(0.02)[a]
14	0.27(0.05)[a]	0.43(0.08)[a]	0.44(0.08)[a]
15	0.22(0.05)[a]	0.14(0.03)[a]	0.13(0.02)[a]
16	0.1(0.02)[a]	0.07(0.01)[a]	0.08(0.02)[a]
17	0.19(0.06)[a]	0.19(0.06)[a]	0.19(0.06)[a]

Note. *p<0.05, [a] significance test not conducted, MM1 U_{0i} = random intercept output from multilevel model 1, MM1 U_{1i} = random slope output from multilevel model 1, σ^2_{U0} = variance of the random intercept, σ^2_{U1} = variance of the random slope of time, σ^2_{U01} = covariance between the random intercept and slope of time, σ^2_e = residual variance.